Reviewer's report

Title: Anaesthesiology and Cognitive Impairment: A Narrative Review of Current Clinical Literature

Version: 0 Date: 04 Sep 2019

Reviewer: Robert Wilder

Reviewer's report:

Abstract: line 30. Define/spell out AD.

Page 6 lines 77-80: The ISPOCD1 study did not show correlation with variables of anesthetic management (hypotension and hypoxemia), but rather with the patient parameter of age and with surgical parameters: length of anesthesia (and by correlation length of surgery), repeated surgical procedures, infections and respiratory complications. This suggests that inflammatory response to surgery and infection is a larger player than anesthesia, per se.

Page 9, line 127: "studied", not "studies"

Page 12, lines 180-182: Your statement: "As summarized above, there is a large body of evidence which supports the existence of delayed neurocognitive recovery and post-operative neurocognitive disorder." The statement "It is less clear whether exposure to anesthesia increases the risk of developing dementia." is likely also true, although I would prefer to see it phrased "It is unclear . . .". The juxtaposition of these two statements in the same paragraph implies that anesthesia increases the risk of delayed neurocognitive recovery and post-operative neurocognitive disorder, which the preceding pages did NOT demonstrate. The text demonstrates postoperative problems but there was nothing in the paragraphs to conclude that general anesthesia or inhalation anesthesia was a definitive cause of delayed neurocognitive recovery and post-operative neurocognitive disorders. Indeed, the preceding text either suggested no effect or the evidence was sufficiently mixed as to make drawing the conclusion of causation extremely problematic. This paragraph needs to be changed.

Page 13, lines 190-91: Unless the controls were patients who underwent surgery without general anesthesia, this Korean study suffers from the same major confounder as most studies in this field. It is impossible to separate out the effects of surgery including increased neuroinflammation from a direct effect of the anesthesia. Although the differing hazard ratios among the three inhaled anesthetics is interesting, it would be more understandable if there were an obvious mechanism for differences between the agents.

Page 17, lines 267-70: the authors speak of a study comparing inhalation anesthesia to TIVA. The subsequent discussion of the study does not give any results of differences with anesthesia technique. This would lead the reader to conclude that technique is not important, but this should be stated in the text (if true).
This should more properly read "This review summarizes previous findings relevant to the potential relationship between surgery, anaesthesia exposure and POCD." The literature cited does not definitively demonstrate an independent effect of anesthesia.

Quality of written English
Please indicate the quality of language in the manuscript:

Acceptable

Declaration of competing interests
Please complete a declaration of competing interests, considering the following questions:

1. Have you in the past five years received reimbursements, fees, funding, or salary from an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

2. Do you hold any stocks or shares in an organisation that may in any way gain or lose financially from the publication of this manuscript, either now or in the future?

3. Do you hold or are you currently applying for any patents relating to the content of the manuscript?

4. Have you received reimbursements, fees, funding, or salary from an organization that holds or has applied for patents relating to the content of the manuscript?

5. Do you have any other financial competing interests?

6. Do you have any non-financial competing interests in relation to this paper?

If you can answer no to all of the above, write 'I declare that I have no competing interests' below. If your reply is yes to any, please give details below.

I declare that I have no competing interests

I agree to the open peer review policy of the journal. I understand that my name will be included on my report to the authors and, if the manuscript is accepted for publication, my named report including any attachments I upload will be posted on the website along with the authors' responses. I agree for my report to be made available under an Open Access Creative Commons CC-BY license (http://creativecommons.org/licenses/by/4.0/). I understand that any comments which I do not wish to be included in my named report can be included as confidential comments to the editors, which will not be published.

I agree to the open peer review policy of the journal